



US008148356B2

(12) **United States Patent**
Pavliv

(10) **Patent No.:** **US 8,148,356 B2**
(45) **Date of Patent:** **Apr. 3, 2012**

(54) **ACETYLCYSTEINE COMPOSITION AND USES THEREFOR**

JP 7309746 * 11/1995
WO WO 01/80832 A2 11/2001
WO WO 03/011249 A 2/2003

(75) Inventor: **Leo Pavliv**, Cary, NC (US)

(73) Assignee: **Cumberland Pharmaceuticals, Inc.**,
Nashville, TN (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 270 days.

(21) Appl. No.: **11/209,804**

(22) Filed: **Aug. 24, 2005**

(65) **Prior Publication Data**
US 2007/0049640 A1 Mar. 1, 2007

(51) **Int. Cl.**
A61K 31/33 (2006.01)

(52) **U.S. Cl.** **514/183**

(58) **Field of Classification Search** 514/183
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,849,452	A	7/1989	Dulce et al.	
5,114,974	A	5/1992	Rubin	
5,124,351	A	6/1992	Rabinovitz et al.	
5,206,269	A	4/1993	Ludwig et al.	
5,272,166	A	12/1993	Breslow et al.	
5,354,748	A	10/1994	Sugita et al.	
5,474,757	A	12/1995	Yang	
5,691,380	A	11/1997	Mason et al.	
5,700,653	A *	12/1997	Lu et al.	435/15
5,807,894	A *	9/1998	Stroppolo et al.	514/562
5,882,688	A	3/1999	Alonso et al.	
6,103,748	A	8/2000	Bryan	
6,114,387	A	9/2000	Cutler	
6,149,891	A	11/2000	Korenstein et al.	
6,281,222	B1	8/2001	Salzman et al.	
6,355,682	B1	3/2002	Weinberg	
6,468,965	B1	10/2002	Cutler	
2001/0031737	A1	10/2001	Richardson et al.	
2002/0002146	A1	1/2002	Halevie-Goldman	
2002/0025310	A1	2/2002	Bland	
2002/0031513	A1	3/2002	Leibovitz	
2004/0022873	A1 *	2/2004	Guilford et al.	424/702

FOREIGN PATENT DOCUMENTS

CA	821 525	A	8/1969
CA	2 526 208	A1	12/2004
EP	0639375	A1 *	2/1995
FR	2 788 436	A	7/2000
GR	1 002 731	B	7/1997

OTHER PUBLICATIONS

Merck Index 13th ed., n. 3546, pp. 620-621 (2001).
 Merck Index 13th ed., n.90, p. 17 (2001).
 Handbook of Pharmaceutical Excipients, 225-228, (R. Rowe et al. eds), 4th ed. (2003).
 Tepel at al., "Prevention of Radiographic-Contrast-Agent—Induced Reductions in Renal Function by Acetylcysteine," *The New England Journal of Medicine* 343(3):180-184 (2000).
 Package Insert of Acetadote®, Intravenous N-Acetylcysteine, Cumberland Pharmaceuticals, Inc. (2004).
 Package Insert of Parvolexe® Injection, Acetylcysteine, David Bull Laboratories (2001).
 Package Insert of Acetylcysteine Solution, USP, American Regent Laboratories, Inc. (1998).
 Van Loenen A.C. et al., "Bereiding en houdbaarheid van een acetylcysteine-injectie/Formulation and shelf-life of acetylcysteine injections," *Pharm Weekbl* 120:313-317 (1985).
 International Search Report and Written Opinion of the International Searching Authority for International Application No. PCT/US2006/020691 (Nov. 27, 2006).
 Package Insert of Fluimucil® Injection, Acetylcysteine, Zambon GmbH (2000).

* cited by examiner

Primary Examiner — Brandon Fetterolf
Assistant Examiner — Christopher R Stone
(74) *Attorney, Agent, or Firm* — Stites & Harbison PLLC;
Richard S. Myers, Jr.

(57) **ABSTRACT**

This invention relates to novel acetylcysteine compositions in solution, comprising acetylcysteine and which are substantially free of metal chelating agents, such as EDTA. Further, this invention relates to methods of making and using the acetylcysteine compositions. The present compositions and methods are designed to improve patient tolerance and compliance, while at the same time maintaining the stability of the pharmaceutical formulation. The compositions and methods of this invention are useful in the treatment of acetaminophen overdose, acute liver failure, various cancers, methacrylonitrile poisoning, reperfusion injury during cardio bypass surgery, and radiocontrast-induced nephropathy, and can also be used as a mucolytic agent.

14 Claims, No Drawings